REMARKS

Claims 1-32 were pending in the application. Claims 1-32 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 1-32 have been rejected under 35 U.S.C. §103(a) as being deemed unpatentable in view of Bergsten (U.S. Patent No. 6,360,306), DuLac (U.S. Patent No. 5,550,986), Kern et al. (U.S. Patent No. 5,870,537), Wilson (U.S. Patent No. 6,718,347), Mogul (RFC0917: Internet subnets, 1984, ACM, pages 1-17), Miller (U.S. Patent No. 5,506,984) and Stancil (U.S. Patent No. 6,272,584). Of the Claims, Claims 1, 11 and 21 are independent. Claims have been amended to clarify the Applicant's invention. Claims 33-35 are newly added. Support for the newly added claims is in the applicants' specification as originally filed. (*See,* for example, Page 21, lines 3-11; Page 22, lines 20-21; Fig. 6, 610; Page 15, lines 17-20.) The application as amended and argued herein, is believed to overcome the rejections.

Regarding Rejections under 35 U.S.C. §112, first paragraph

Claims 1-32 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

The specification describes that a DOSM communicates with an intelligent storage node by obtaining a connection with an intelligent storage node. (*See*, for example, page 21, lines 3-11.) The connection (which may be a point-to-point connection, see for example, page 20, lines 15-18) is established over a wide area, public access network coupling the DOSMs to the intelligent storage nodes. The establishment of the point-to-point connection by the DOSM with a storage node describes an embodiment for "intelligent storage nodes directly accessible to said DOSMs over a wide area, public access network coupling the DOSMs to the intelligent storage nodes" as claimed by the Applicants.

One of the storage nodes is directly accessible to one of the DOSMS "through a point-to-point connection established between the one of the intelligent storage nodes and the one of said DOSMs over the wide area, public access network" as claimed by the Applicants in newly added Claim 34.

Furthermore, the specification describes that directory information stored in the VFS may be replicated between storage centers allowing a distributed storage manager in one storage center to access the replicated distributed directory in another storage center via a network, for example, using IP address mapping. (*See* Fig. 16, storage center 1510, 1530, Virtual File System 50; Page 44, lines 1-4.)

Thus, Applicants respectfully request removal of the rejections under 35 U.S.C. §112, first paragraph and acceptance of claims 1-32.

Regarding Rejections under 35 U.S.C. § 103(a)

Claims 1-2, 4-12, 14-17, 19-20 and 32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bergsten (U.S. Patent No. 6,360, 306) in view of DuLac (U.S. Patent No. 5, 550,986, Kern et al. (U.S. Patent No. 5,870,537), Wilson (U.S. Patent No. 6,718,347) and further in view of Xu (U.S. Patent No. 6,324,581).

Claims 21-22, 24-22 and 29-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bergsten in view of Dulac, Kern and Wilson.

Claims 3 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bergsten in view of Dulac, Kern and Wilson, Xu and further in view of Mogul (RFC0917: Internet subnets, 1984, ACM, pages 1-17).

Claim 23 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bergsten in view of Dulac, Kern and Wilson and further in view of Mogul (RFC0917: Internet subnets, 1984, ACM, pages 1-17).

Claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bergsten in view of DuLac, Kern, Wilson and Xu, and further in view of Miller (U.S. Patent No. 5,506,984).

Claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bergsten in view of DuLac, Kern and Wilson, and further in view of Miller (U.S. Patent No. 5,506,984).

Claim 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Bergsten in view of DuLac, Kern, and Wilson and further in view of Stancil (U.S. Patent No. 6,272,584).

Turning to the cited art, Bergsten discusses a method for storing multiple backup copies of data in geographically separate locations. The system discussed by Bergsten includes a plurality of storage controllers coupled via a communications link. Each of the plurality of storage controllers is coupled to a local host and a local storage array. The storage controllers co-operate to allow any of the hosts to access data stored in any of the locally coupled storage arrays. (*See* Bergsten Fig. 1, storage controllers (3-1, .., 3-M), communications link (9), host (2-1, .., 2-M), storage array (4-1,...,4-M); col. 3, lines 36-63.)

Cited reference DuLac discusses a RAID array that includes an array of storage nodes with each storage node including a data storage device and a processor.

Cited reference Kern discusses a disaster recovery system that provides remote data shadowing by storing a mirror image (logical or physical) of the primary device on a secondary device. Upon detecting a failure in the primary data storage device, all access is swapped (switched) to the secondary data storage device. (*See* Kern col. 9, lines 14-31 and col. 12, lines 1 -28 and Figs 1 and 5.)

Cited reference Wilson discusses a system for maintaining coherence among copies of a database shared by multiple computers with data stored in storage subsystems. (*See* Wilson Fig. 3 and Abstract.)

Cited reference Mogul discusses partitioning a host address space by assigning subnet numbers to LANs.

Cited reference Miller is directed to a method for data retrieval in a distributed system. A query entered at a user interface is directed to different databases using linked references by an organization engine until the requested data is retrieved from one of the databases. (*See* Miller col. 14, lines 10-51.)

Cited reference Stancil is directed to a computer system with a non-volatile memory module that is shared by a plurality of system components during initialization.

Cited reference Xu is directed to a network fileserver system that includes a plurality of data movers, each controlling access to one of a plurality of file systems. Access to each file system is controlled by a respective data mover which may allow another data mover to access the file system over a bypass path. (*See* Abstract.)

To establish a prima facie case for obviousness under 35 U.S.C. 103(a), (1) there must be some suggestion or motivation to combine reference teachings; (2) there must be a reasonable expectation of success; (3) the references when combined must teach or suggest all the claim limitations. (*See* MPEP 2143.) For the reasons discussed below, it is respectfully submitted that the Office has not established a prima facie case under 35 U.S.C. 103(a) for claims 1-32 and that therefore, claims 1-32 are allowable.

The references when combined do not teach or suggest all the claim limitations

Bergsten does not teach or suggest at least:

> "providing at least three intelligent storage nodes directly accessible to said DOSMs over a wide area, public access network coupling the DOSMs to the intelligent storage nodes, said intelligent storage nodes accessible to said DOSMs via public access network addresses associated with the intelligent storage nodes"

as claimed by the Applicant in Claim 1.

In contrast, in the system discussed by Bergsten each storage controller is locally coupled to a respective local storage array. Access to files stored in local storage array is only through the respective storage controller.

The storage controllers are coupled via a communications link that is separate from the local link that couples each storage array to its respective storage controller. Communication between storage controllers is provided over the communication link to allow any of the storage controllers to indirectly access data stored in any of the locally coupled storage arrays via the respective storage controller. For example, referring to Fig. 1 of Bergsten, host 2-M can only access data stored in MSD 4-1-1 indirectly through storage controller 3-1 to which MSD 4-1-1 is directly coupled.

Furthermore, as each storage controller (for example, Fig. 3, 3-1) is coupled to a respective storage array (for example, Fig. 3 4-1), Bergsten does not teach or suggest a "network coupling the DOSMs to the intelligent storage nodes" In contrast, only the storage controllers are coupled to a communications path (see, for example, communications path 9). (*See* Bergsten, Fig. 1 storage controller (3-1), storage array (4-1), communication link 9, 8; Col. 3, lines 36-53.)

Furthermore, Bergsten does not teach or suggest at least:

"in the event of a failure of said first intelligent storage node resulting in a failover condition rendering said first intelligent storage node unavailable, upon receiving a request for said file by a DOSM, identifying by said DOSM that said second intelligent storage node stores said duplicate of said file, redirecting said file request, via said network, to said second intelligent storage node and indicating a location determined at said DOSM for said file in said second intelligent storage node"

as claimed by the Applicant in Claim 1.

Bergsten does not even teach or suggest the Applicant's disclosed "intelligent storage node" that includes "a processor core and a plurality of storage devices". Bergsten merely discusses failure of a communication medium, host computer, storage device in a storage array or a storage controller. There is no teaching or suggestion of "failure of said first intelligent storage node" or of "redirecting said file request, via said network, to said second intelligent storage node".

In contrast, a request is redirected to another storage controller that is locally coupled to the MSD that stores the requested file.

The additional references Kern, DuLac, Wilson, Mogul, Miller, Stancil and Xu fail to cure the deficiencies of Bergsten noted above. The additional references fail to disclose or suggest at least "each intelligent storage node including a processor core and a plurality of storage devices".

DuLac does not teach or suggest at least:

"each intelligent storage node including a processor core and a plurality of storage devices"

as claimed by the Applicant in Claim 1.

In contrast, the "intelligent storage node" discussed by DuLac merely refers to an "intelligent disk drive" that includes a magnetic disk drive unit and a processor for storage media control such as head positioning, data encoding/decoding and defect handling. DuLac refers to a Small Computer System Interface (SCSI) disk drive as being

a typical example of an "intelligent disk drive". (*See* DuLac col. 3, lines 54-60, Fig. 2; col. 4, lines 12-17.) As shown in Fig. 2 of DuLac, the node includes one processor (P) for controlling one storage element (D) and also includes buffers for volatile data storage. The buffers for volatile data storage discussed by DuLac do not teach or suggest the Applicant's disclosed "plurality of storage devices". As is well-known to those skilled in the art, a storage device provides non-volatile data storage. In contrast, in an embodiment of the Applicant's claimed invention, an intelligent storage node includes a core processor coupled to a plurality of storage devices, and each of the storage devices may be a SCSI disk drive. (*See*, for example, Page 25, lines 5-10; Fig. 7 in the Applicant's application as originally filed.)

Xu's discussion of a system that includes a plurality of data movers with each data mover controlling access to one of a plurality of file systems does not teach or suggest at least the Applicant's claimed:

"intelligent storage nodes directly accessible to said DOSMs over a wide area, public access network coupling the DOSMs to the intelligent storage nodes"

as claimed by the Applicant in Claim 1.

In contrast, Xu merely discusses a data mover for controlling access to a file system. The Applicant's claimed "intelligent storage nodes" are "directly accessible to said DOSMS". The DOSMS "for receiving requests for files in a network storage file system".

Furthermore, the additional references Kern, DuLac, Wilson, Mogul, Miller, Stancil and Xu fail to disclose or suggest at least

"intelligent storage nodes accessible to said DOSMs over a wide area, public access network coupling the DOSMs to the intelligent storage nodes, said intelligent storage nodes accessible to said DOSMs via public access network addresses associated with the intelligent storage nodes, each intelligent storage node including a processor core and a plurality of storage devices"

and so fail to disclose the invention as recited in claim 1.

Claims 2-10 and 33-35 are dependent claims that depend directly or indirectly on claim 1, which has been shown to be non-obvious over the cited art.

Furthermore Bergsten fails to disclose or suggest at least:

> "generating a mapping between said first network address and said second network address"

as claimed by the Applicant in Claim 2.

In contrast, Bergsten merely discusses mapping between a host address, logical address and physical address. (*See*, for example, col. 9, lines 15-27.) There is no discussion of any mapping between a "first network address" and a "second network address".

Bergsten fails to disclose or suggest at least:

> "storing duplicates of said files in a plurality of intelligent storage nodes in said second storage center, so as to provide a one to one mapping between said intelligent storage nodes in said first storage center and said intelligent storage nodes in said second storage center.

as claimed by the Applicant in Claim 5.

In contrast, Bergsten merely discusses mapping to multiple physical addresses which may be distributed among multiple MSDs which may be located in different storage arrays. (*See*, for example, col. 6, lines 34-37.)

Independent claims 11 and 21 recite a like distinction and are thus non-obvious over the cited art. Claims 12-20 and 31-32 depend directly or indirectly on claim 11 and claims 22-30 depend directly or indirectly on claim 21 and are thus non-obvious over the cited references.

Thus, the references when combined do not teach or suggest all the claim limitations.

Therefore, separately or in combination, Bergsten, DuLac, Kern, Wilson, Mogul and Miller do not teach or suggest the Applicant's claimed invention.

The Office has failed to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 because the references when combined do not teach or suggest all the claim limitations.

Accordingly, the present invention as now claimed is not believed to be made obvious from the cited references. Removal of the rejections under 35 U.S.C. § 103(a) and acceptance of claims 1-35 is respectfully requested.

CONCLUSION

In view of the foregoing, it is submitted that all claims (claims 1-32) are in condition of allowance. The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the above-referenced application.

Please charge any shortages and credit any overcharges to Deposit Account Number 50-0221.

Respectfully submitted,

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